

MOUSETRAP CAR

10th-12th Grade College Prep Physics, Alex Saslow 10th-12th Grade Manufacturing & Product Development, Ron Solomon NAPA HIGH SCHOOL

Groups consisting of Physics students and Manufacturing and Product Development students worked together to design, prototype, and build a vehicle powered only by a provided mousetrap. Students could use any materials they wished, as long as it was not a power source. The only requirements were that the mousetrap and a piece of sheet metal were included in the vehicle, and the the entire vehicle travelled at least ten feet. The scope of the project given to the students was: Teams of Physics and Manufacturing students will design and build a rolling vehicle (car) powered by a mouse trap. The vehicle must incorporate the entire 3" x 4" piece of aluminum and the mousetrap provided by the instructors. Students are responsible for all other materials. The only source of power is the mousetrap. The mousetrap car that can travel the furthest wins!

The final exhibition for the project was a race day where teams competed against each other to see whose mousetrap car could go the furthest. Through this project students designed drawings to scale meeting industry standards, learned and utilized basic machining tools and equipment, created a free body diagram of their mechanism showing how the force changes magnitude, and measured/calculated quantities such as mass of mechanism, average torque of mousetrap, force applied to axle, torque of axle, torque of wheel, theoretical acceleration of mechanism, etc.

Teacher Reflections

Some of the groups were very ambitions, making a "gear box" system so that the car would start on a higher gear to get it moving, before jumping to a lower gear for more power. We found that students did not use their time wisely until the first prototype was due. After the initial grading was received, the groups really started working well together. We didn't see as much planning based on physics and math as we originally wanted, but the projects were still very successful. In the end it was a very interactive project that the students had a lot of fun with, and they even accidentally learned something.